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A Hospital based Retrospective Study on Maxillofacial Injuries and its Treatment

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Abstract: ***Purpose: This study was to analyze the epidemiology, patterns, and management of maxillofacial injuries due to road traffic accidents in a tertiary care center of the largest government run hospital in the state of Rajasthan India[1] (http://www.jaipursearch.com/medical/smshospital.htm). Methods: The study was conducted between January 2021 to June 2023, 1954, patients of maxillofacial trauma were admitted to Trauma Centre of Sawai Man Singh Medical College Jaipur Rajasthan, India. The following data were analyzed: age, gender, data of the trauma, alcohol and drug abuse, mechanism of injury, fracture site, type of treatment and length of hospital stay. Results: Of the 1954 patients included in the study 1404 were males and 550 females (ratio 2.5:1). The most common mechanism of injury was two-wheeler accident (82%). Mandible was the most common bone involved in the face. Associated injuries were found in 45%. 82% patients underwent surgical procedures. Average hospital stay was 3 days. Conclusion: The result of the study exhibit that road traffic accident particularly two-wheeleris the main reason for maxillofacial injuries followed by fall from height. Fracture reduction followed by miniplate fixation is the most widespread technique used followed by splinting and conservative management.***

Keywords: Maxillofacial injuries, Road traffic accidents, Epidemiology, Management, Trauma center

1. Introduction

During 400 BC Hippocrates described an array of facial injuries. Facial region provides protection to the anterior cranium along with play an important role in appearance of the person. This region is associated with important function of sight smell taste, breathing and talking. Quality of life is severely affected with loss of any of the functions.

These injuries occur in good number of patients of trauma, requiring prompt diagnosis and management. The number of maxillofacial injuries is continuously increasing because of traffic and lack of wearing protective helmets leading to road traffic accidents which is the leading cause of maxillofacial injuries.

The main purpose of this study was to find out the incidence and pattern of maxillofacial injuries resulting from various etiological factors and treatment modalities and their complications. The anatomical significance of maxillofacial injuries because it is a gateway of important systems of the body such as respiratory and digestive system. Due its proximity to central nervous system these injuries can result in serious dysfunction.

2. Materials and Methods

Total 1954 patients were included in the study admitted from January 2021 to June 2023 (30 months). For most of the patients Open Reduction and internal fixation was done with miniplates, Conservative management was done in patients with isolated nasal bone fracture and un-displaced fracture. Based on History, Examination, 3D CT face, OPG, the diagnosis was made.

The patients were assessed based on age, sex, etiology, fractured bones, and treatment modalities and complications. Treatment given were open reduction, close reduction, fixation with miniplates. Different approaches for reduction and fixation were used according to indications either intraoral approach or extra oral approach.

3. Results

Leforte 2 fracture was the most common site of maxilla fracture. Gender distribution was 2.5:1. Males are more prone to trauma because of rash driving, outdoor works, alcoholism. The most common involved age group is 21-30, followed by 31- 40 yrs.

Road traffic accident is the most common etiological factor. The commonest fractured bone is mandible (30.8%). Most of the patients had multiple bone fractures including mandible, maxilla, and zygomatic complex fracture (40.7%) [Table 4]. The most commonly involved site was body of the mandible (75.9%) followed by Para symphysis (67.16%). Coronoid fracture was reported [6-8] to be least common (2.32%) [Table 5]. Among maxillary fractures, the most common fracture was Lefort2 fracture (79.23%) followed by Leforte 1 and then Leforte 3 [Table 6]. Motamedi [7] also reported Leforte 2 was the commonest fracture in his study.

Most of the patients were treated by open reduction and internal fixation 75%, conservative management 20% and eyelet (Ivy Loop method) wiring mostly in paediatric patients.

According to Ajmal, *et al.*,[8] open reduction and internal fixation has proven to be the most effective method for treatment of mandibular fractures. In most of the patients, Open reduction & internal fixation (ORIF) was done under general anaesthesia, rest of them under local anaesthesia and conscious sedation. All the patients of circum-mandibular wiring were treated under General anaesthesia (GA). The close reduction was done under local anaesthesia.

Miniplates and Reconstruction plates were used most commonly, Reconstruction of orbital floor was done using orbital mesh or bone graft.

Out of patients who received ORIF, in 5.22% cases plates were removed within 6 months to 2 years because of secondary infection, sinus formation, or pus discharge from the site. There was no single case of delayed union or non-union reported

Table 1: Gender (N = 1954)

Gender	No. of patients	Percentage
Male	1404	71.85
Female	550	28.15

Table 2: Age Group (N = 1954)

Age Group	No. of Patients	Percentage
0-10	186	9.51
11-20	310	15.86
21-30	608	31.11
31-40	359	18.37
41-50	250	12.79
51-60	197	10.08
61-70	33	1.68
71-80	10	0.51
81-90	1	0.05

Table 3: Etiology (N = 1954)

Factors	Number of Patients	Percentage
RTA	1647	84.28
Fall from height	271	13.86
Assault	21	1.07
Firearm injury	9	0.46
Animal bite	6	0.30

RTA: Road traffic accident

Table 4: Fracture involving different bones (N = 1954)

Bones	Number of patients	Percentage
Mandible only	603	30.8
Mandible + Maxilla + Zygoma	796	40.7
Maxilla	290	14.8
Zygomatic Complex	359	18.3
NOE	109	5.57
Orbital Floor	26	1.33

The commonest fractured bone is mandible (47.87%). Most of the patients had multiple bone fractures including mandible, maxilla, and zygomatic complex fracture (62.42%), NOE: Nasoorbito ethmoid

Table 5: Mandible Fracture sites

Fracture site	No. of patients	Percentage
Para symphysis	405	67.16
Symphysis	34	5.63
Body	458	75.9
Angle	234	38.8
Condyle, sub condyle	256	42.45
Ramus	91	15.09
Coronoid	14	2.32
Edentulous mandible	10	1.65

Regarding distribution of mandible fractures, the most commonly involved site was body of the mandible (75.9%) followed by Para symphysis (67.16%) and the coronoid fracture was least common (2.32%)

Table 6: Maxilla Fractures

Site	Number of Patients	Percentage
Leforte 1	54	12.18
Leforte 2	351	79.23
Leforte 3	38	8.57

Table 7: Treatment Modalities

Treatment modalities	No. of Patients	Percentage
Conservative	416	21.2
Open Reduction and fixation	1387	70.98
Eyelet wiring	151	7.72

Table 8: Treatment modalities used for mandible

Modalities	No. of patients	Percentage
Conservative IMF	151	25.04
Open Reduction and fixation	452	74.95

Table 9: Need for second surgery for removal of plates in patients (N = 102)

Number of patients/ sites	Number of patients	Percentage
Upper face	34	33.33
Mid face	12	11.76
Mandible	56	54.90

4. Discussion

According to WHO Road Traffic Accidents constitute nearly 25% of all injuries fatalities worldwide. 90% occurring in low- and middle-income countries. Road Traffic accidents incidence in developed countries are now falling while they continue to rise in horrifying speed in the low- and middle-income countries of Africa and Asia.

It is the major cause of death in India.Most of the accidents occur due to high speed, driving under influence, and fatigue especially in commercial vehicle drivers who drive very long distances. Bad road condition also play an important role in RTA.

In this study Mandible fracture is the most common fracture observed. Pediatric patients were treated by Eyelet wiring and few cases with bioresorbable plates under general anesthesia. Pediatric patients benefit from the advantage of bioresorbable plates as it results in faster mobilization and the avoidance of secondary surgery for removal of implants. Minimally displaced and undisplaced fractures can be treated with conservative methods, to avoid hospitalization and low risk of infections.

Mouth opening was normal in all patients. Temporomandibular joint stiffness was reported during first week of after releasing IMF which comes normal after a week with physiotherapy.

Dietary restrictions due to mouth closure and patient compliance are limitations. In epileptic patients IMF cannot be done.

5. Conclusions

This study exhibits that Road traffic accidents is the main reason for faciomaxillary injuries followed by fall from height. They are more commonly seen in males. Mandible is

the most frequently involved bone. Open reduction and internal fixation with miniplates were the treatment modality in most of the cases but conservative management also has a significant role.

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